

**UNITED STATES DEPARTMENT OF COMMERCE****Patent and Trademark Office**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/305,240 05/04/99 SHIM

B 5484-48

EXAMINER

MM91/1214

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NADAV, D

ART UNIT

PAPER NUMBER

2811

DATE MAILED:

12/14/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

**Advisory Action**Application No.  
**09/305,240**Applicant(s)  
**Shim et al.**Examiner  
**ORI NADAV**Group Art Unit  
**2811****THE PERIOD FOR RESPONSE: [check only a) or b)]**

- a) ☐ expires \_\_\_\_\_ months from the mailing date of the final rejection.
- b) ☒ expires either three months from the mailing date of the final rejection, or on the mailing date of this Advisory Action, whichever is later. In no event, however, will the statutory period for the response expire later than six months from the date of the final rejection.

Any extension of time must be obtained by filing a petition under 37 CFR 1.136(a), the proposed response and the appropriate fee. The date on which the response, the petition, and the fee have been filed is the date of the response and also the date for the purposes of determining the period of extension and the corresponding amount of the fee. Any extension fee pursuant to 37 CFR 1.17 will be calculated from the date of the originally set shortened statutory period for response or as set forth in b) above.

- ☐ Appellant's Brief is due two months from the date of the Notice of Appeal filed on \_\_\_\_\_ (or within any period for response set forth above, whichever is later). See 37 CFR 1.191(d) and 37 CFR 1.192(a).

Applicant's response to the final rejection, filed on Aug 31, 2000 has been considered with the following effect, but is NOT deemed to place the application in condition for allowance:

☒ The proposed amendment(s):

- ☒ will be entered upon filing of a Notice of Appeal and an Appeal Brief.
- ☐ will not be entered because:
- ☐ they raise new issues that would require further consideration and/or search. (See note below).
  - ☐ they raise the issue of new matter. (See note below).
  - ☐ they are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal.
  - ☐ they present additional claims without cancelling a corresponding number of finally rejected claims.

NOTE: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

- ☐ Applicant's response has overcome the following rejection(s):
- \_\_\_\_\_
- \_\_\_\_\_

- ☐ Newly proposed or amended claims \_\_\_\_\_ would be allowable if submitted in a separate, timely filed amendment cancelling the non-allowable claims.
- ☒ The affidavit, exhibit or request for reconsideration has been considered but does NOT place the application in condition for allowance because:  
See attached note
- \_\_\_\_\_

- ☐ The affidavit or exhibit will NOT be considered because it is not directed SOLELY to issues which were newly raised by the Examiner in the final rejection.

- ☒ For purposes of Appeal, the status of the claims is as follows (see attached written explanation, if any):

Claims allowed: None

Claims objected to: None

Claims rejected: 5-7 and 9

- ☐ The proposed drawing correction filed on \_\_\_\_\_ ☐ has ☐ has not been approved by the Examiner.
- ☐ Note the attached Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_
- ☐ Other

Art Unit: 2811

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant argues on page 3 that MacDougall et al. do not teach a channel region exclusive of the first sector, because MacDougall et al. implant impurities into a channel region extending from the source region to the drain region, not just a portion of the channel region, as recited in column 2, lines 5-29 and lines 58-59).

MacDougall et al. teach in column 2, lines 5-29 introducing dopants into the gate and the channel region between the source and drain regions. MacDougall et al. further teach in column 2, lines 58-59, that the conduction of electrons from the source to the drain regions would be in the channel region. None of the above recitations call for implanting impurities into a channel region extending from the source region to the drain region, not just a portion of the channel region, as argued by applicant. Introducing dopants into the gate and the channel region between the source and drain regions does not mean that the dopants are introduced in the whole channel region and are in contact with the source and drain regions. Furthermore, stating that the conduction of electrons from the source to the drain regions would be in the channel region does not relate to implanting boron impurities into the channel region.

Art Unit: 2811

2. Applicant argues on page 3 that the methods described by MacDougall et al. in column 2, lines 10-17 and column 6, lines 2-10, of implanting dopants into the channel region by exposing the unmasked gate insulator, mean that the dopants are introduced into the whole channel region.

MacDougall et al. teach in columns 2 and 6 introducing dopants into the gate and the channel region between the source and drain regions. There is no description of introducing dopants into the gate and the whole channel region. In fact, implanting dopants into the gate and the channel region in one step means that MacDougall et al. teach away from introducing dopants into the whole channel region. Figure 1 depicts gate 14 having a width substantially equal to that of layer 6, whereas portions of the gate insulating layer 15 overlap portions of the source/drain regions. If dopants were introduced over the whole width of the gate insulator, then some boron implantation would occur in the source/drain regions. MacDougall et al. do not disclose further implanting the source/drain regions. Therefore, for dopants to be introduced only into the whole channel region, as argued by applicant, a special mask covering part of the gate insulator would have to be used. MacDougall et al. does not teach using a special mask covering part of the gate insulator. Thus, it is clear that the dopants are introduced into the gate and into layer 6 of the channel region located underneath the gate, as illustrated in figure 1, and not in other portions of the channel region.

Art Unit: 2811

3. Applicant argues on page 3 that the threshold voltage of MacDougall et al.'s device can not be precisely controlled if the channel region is exclusive of the first sector.

MacDougall et al. introduce boron dopants into the channel region in order to lower the threshold voltage (column 2, lines 20-22). The threshold voltage can increase if the channel region is exclusive of the first sector.

4. Applicant argues on page 4 that although layer 6 depicts only a portion of the channel, it has no significance or meaning, because MacDougall et al.'s channel extends all the way between the source and the drain regions.

Figure 1 depicts the width of channel 6 is substantially identical to that of the gate. MacDougall et al. teach simultaneously introducing dopants into the gate and the channel region. Therefore, although applicant did not find any reason for layer 6 to extend along only a portion of the channel region, it is clear that layer 6 depicts the extent of the boron dopants in the channel region.

Art Unit: 2811

Papers related to this application may be submitted to Technology center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2811 Fax Center number is (703) 308-7722 and 308-7724. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.

Any inquiry concerning this communication or any earlier communication from the Examiner should be directed to *Examiner Nadav* whose telephone number is (703) 308-8138. The Examiner is in the Office generally between the hours of 7 AM to 3 PM (Eastern Standard Time) Monday through Friday.

Any inquiry of a general nature or relating to the status of this application should be directed to the **Technology Center Receptionists** whose telephone number is 308-0956

*William Mintel*

**William Mintel**  
**Primary Examiner**  
APR 2001

Ori Nadav, Ph.D.

December 11, 2000